
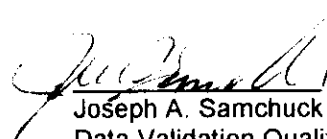


Data Limitations and Validation Report
for Environmental Groundwater Samples
Collected from the Argonne National Laboratory - West
Scoville, ID
Case No. 93052416
SDG. No. 93052416
Selected Target Analyte List (TAL) Metals plus Tin
Three Aqueous Samples

Validated by:

 3-5-96
Ricky C. DePaul
Data Validation
Reviewer

Approved by:

 3-5-96
Joseph A. Samchuck
Data Validation Quality
Assurance Officer

A. TITLE:

INORGANIC DATA LIMITATIONS and VALIDATION REPORT

Project Site: Waters from Argonne National Laboratory - West
Sample Type: Aqueous samples
Analysis Type: Selected TAL Metals plus Tin
Case No.: 93052416
SDG No.: 93052416

B. INTRODUCTION:

A complete review, following the procedures outlined in SMO-SOP-12.1.5¹, was performed on the data package, labeled Case No. 93052416, SDG# 93052416, submitted by Biospherics Incorporated. Based upon the information available for review, it appears as though, the laboratory analyzed the aforementioned water samples from the Argonne National Laboratory - West according to SW846 analytical protocols. The deliverable format does not comply with data package requirements pursuant with Level A validation protocol. The review could not include Level A data validation confirmation.

C. CONTRACT AND TECHNICAL REVIEW:

Site: Water from Argonne National Laboratory - West
Type: Selected TAL Metals plus Tin
Case No.: 93052416
SDG No.: 93052416
Laboratory: Biospherics Incorporated

Sample Identification:

<u>FIELD ID</u>	<u>LAB ID</u>
EBR II NO1	93052416
EBR II NO2	93052416-2
MW-11	93052416-3

CTR COMMENTS:

1. Chain-of-Custody Forms were not provided for the samples in this SDG. Hence, the sample data could not be adequately analyzed for holding time and sample preservation requirements.
2. The laboratory included nonpertinant portions of the sample data relative to mercury. Mercury, selenium, thallium, and tin were not included as part of the analyte list for the samples in this SDG.
3. The validator attempted to verify the positive result for arsenic as noted in sample EBR II NO1. However, the laboratory did not provide sufficient raw data calibration data to enable analyte quantitation for arsenic as noted in this sample.
4. The laboratory incorrectly reported to the instrument response level as noted in the raw data for antimony and included in the support documentation. This is grossly incorrect and substantially biases the data set in a statistical sense. The laboratory must report instrument response readings to the IDL and not report values which are noted in the "raw" instrument print-out.

Another example which serves to further illustrate this point is the reported value for beryllium (-2.3 ug/L) as noted for sample MW-11.

5. Portions of the raw data were illegible and provided no useful information. This is anomaly is noted

here for completeness.

It is further the professional opinion of the data reviewer that it is not practically possible nor part of the validation review process to completely re-report incorrect sample results for nondetected results which were incorrectly reported by the laboratory. The validator cites the reporting convention used for antimony as evidenced in sample EBR II NO1 (i.e., -52.8 ug/L). The laboratory's reporting format and misuse of the Form XIV do not easily lend themselves to an accurate and expedient way of attempting to re-report the sample data in an effort to correct the severity of the problem.

6. The sample data were not evaluated for blank contamination. Dilution factors were not chronicled on the Form XIVs as necessary for expedient and accurate (i.e., indicated by use of the "X" flag to denote results used for reporting purposes) evaluation of this parameter. Additionally, the validator has no knowledge of correct detection limits as applicable to these analytes. Additionally, the absence of reporting limits and the practice of reporting results below SOW reporting limits compromised the blank evaluation process. The data reviewer could not therefore evaluate blank contamination in accordance with SMO-SOP-12.1.5¹.
7. The laboratory did not adequately complete the ICP Interference Check Sample (ICS) Form IV. One of the purposes of analyzing the ICP ICS solution is to determine the potential impact of the four interfering analytes on potentially impacted analytes. This was not done. The interfering analytes aluminum, calcium, and magnesium were noted reported for this solution.
8. The Matrix Spike (MS) Form 5A and laboratory duplicate Form 6 were reported with numerous inconsistencies. Specifically, the laboratory reported a "U" flag for sodium as noted under the Q column on this form. This flag has no application relative to be used on this form under this column heading. Arsenic was included as an analyte of interest, reported on the Form I, and should have been included as part of the aqueous spiking solution. The Form 5 was not fully completed regarding the amount of spike added, the spiked sample result, or the matrix spike recovery. The laboratory partially reported a value of (< 50) as noted on the Form 5 but did not indicate which analyte was to be referenced.
9. The aqueous Laboratory Control Sample (LCS) recoveries for numerous analytes were not reported in some instances. Additionally, the Found Values for calcium and sodium were not reported on the Form VII.

D. DATA LIMITATION OVERVIEW:

a. Summary of Qualified Data

Sample EBR II NO1 could not be fully evaluated given the limitations of the data package deliverable. Sample data qualifications were not made for the aforementioned quality control noncompliances (anomalies) as it is not possible to ascertain a cumulative affect of the type or severity of problems impacting sample data quality based upon the unacceptable format of the data package deliverable.

Sample EBR II NO2 could not be fully evaluated given the limitations of the data package deliverable. Sample data qualifications were not made for the aforementioned quality control noncompliances (anomalies) as it is not possible to ascertain a cumulative affect of the type or severity of problems impacting sample data quality based upon the unacceptable format of the data package deliverable.

Sample MW11 could not be fully evaluated given the limitations of the data package deliverable. Sample data qualifications were not made for the aforementioned quality control noncompliances (anomalies) as it is not possible to ascertain a cumulative affect of the type or severity of problems impacting sample data quality based upon the unacceptable format of the data package deliverable.

E. LABORATORY APPRAISAL:

The data package was presented in a format which could not be fully evaluated as per the validation review requirements as defined by Level A validation review criteria. Qualifications applied to the data serve to indicate problems which could effectively be identified based upon specific noncompliant quality control parameters. Various anomalies and inconsistencies prevented a logical and systematic evaluation process of identifying and qualifying analytical results with a given amount of certainty. The following notable items illustrate the systematic problems associated with this deliverable:

- inconsistent reporting of analytical results (i.e., results reported both above and below detection limits referenced in the SOW).
- Negative results reported on the Form Is.
- Absence of laboratory qualifications as noted on the Form Is and associated quality control data.
- Omissions of various analytes on various quality control summary forms

Additionally, deficiencies noted with data presentation and reporting may not preclude additional, more severe problems with the data which could in affect render the data nonusable. It is not possible to make an accurate and complete assessment of the data. Furthermore, overall data usability cannot be appraised for this data set as a result of problems noted with the deliverable.

F. REFERENCES:

1. Standard Operating Procedure For Inorganic Data Validation, "SMO-SOP-12.1.5", Environmental Restoration Program, EG&G, Inc., 1991.

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

EBR II NO1

Lab Name: BIOSPHERICS INCORPORATED Contract: ARGONNE

Lab Code: 93052416 Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Lab Sample ID: 93052416

Level (low/med): LOW Date Received: 05/24/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7			P
7440-36-0	Antimony	-52.8			P
7440-38-2	Arsenic	3.4			P
7440-39-3	Barium	40.9			P
7440-41-7	Beryllium	-1.9			P
7440-43-9	Cadmium	-3.4			P
7440-70-2	Calcium	36140			P
7440-47-3	Chromium	4.8			P
7440-48-4	Cobalt	2.3			P
7440-50-8	Copper	-2.8			P
7439-89-6	Iron	388			P
7439-92-1	Lead	0.8			F
7439-95-4	Magnesium	12644			P
7439-96-5	Manganese	1.5			P
7439-97-6	Mercury				
7440-02-0	Nickel	5.6			P
7440-09-7	Potassium	3.09			F
7782-49-2	Selenium	<5			
7440-22-4	Silver	8.7			P
7440-23-5	Sodium	17454			P
7440-28-0	Thallium	<5			
7440-62-2	Vanadium	9.7			P
7440-66-6	Zinc	-2.3			P
	Cyanide				
	Tin	<50			

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

EBR II NO2

Lab Name: BIOSPHERICS INCORPORATED Contract: ARGONNE

Lab Code: 93052416 Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): WATER Lab Sample ID: 93052416-2

Level (low/med): LOW Date Received: 05/24/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	-93			P
7440-36-0	Antimony	-58.9			P
7440-38-2	Arsenic	5			F
7440-39-3	Barium	40.3			P
7440-41-7	Beryllium	-2			P
7440-43-9	Cadmium	1.2			P
7440-70-2	Calcium	37230			P
7440-47-3	Chromium	-2.5			P
7440-48-4	Cobalt	7.3			P
7440-50-8	Copper	-6.4			P
7439-89-6	Iron	25			P
7439-92-1	Lead	-0.1			F
7439-95-4	Magnesium	12620			P
7439-96-5	Manganese	1.5			P
7439-97-6	Mercury				
7440-02-0	Nickel	-4.4			P
7440-09-7	Potassium				
7782-49-2	Selenium	<5			
7440-22-4	Silver	0.5			P
7440-23-5	Sodium	17688			P
7440-28-0	Thallium	<5			
7440-62-2	Vanadium	9.8			P
7440-66-6	Zinc	-3.2			P
	Cyanide				
	Tin	<50			

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO

MW-11

Lab Name: BIOSPHERICS INCORPORATED

Contract: ARGONNE

Lab Code: 93052416 Case No.:

SAS No.:

SDG No.:

Matrix (soil/water): WATER

Lab Sample ID: 93052416-3

Level (low/med): LOW

Date Received: 05/24/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	-50			P
7440-36-0	Antimony	789			P
7440-38-2	Arsenic	2.9			F
7440-39-3	Barium	45.8			P
7440-41-7	Beryllium	-2.3			P
7440-43-9	Cadmium	3			P
7440-70-2	Calcium	35040			P
7440-47-3	Chromium	4.2			P
7440-48-4	Cobalt	2.7			P
7440-50-8	Copper	1			P
7439-89-6	Iron	33			P
7439-92-1	Lead	4.9			F
7439-95-4	Magnesium	12326			P
7439-96-5	Manganese	2.1			P
7439-97-6	Mercury				
7440-02-0	Nickel	-10.4			P
7440-09-7	Potassium				
7782-49-2	Selenium	<5			
7440-22-4	Silver	8.8			P
7440-23-5	Sodium	17321			P
7440-28-0	Thallium	<5			
7440-62-2	Vanadium	8			P
7440-66-6	Zinc	4.4			P
	Cyanide				
	Tin	<50			P

Color Before:

Clarity Before:

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Color After:

Clarity After:

Artifacts:

Comments: